

ABSTRACT

An improved method for applying organic antireflective coatings to substrate surfaces and the resulting precursor structures are provided. Broadly, the methods comprise chemical vapor depositing (CVD) an antireflective compound on the substrate surface. In one embodiment, the compound is highly strained (e.g., having a strain energy of at least about 10 kcal/mol) and comprises two cyclic moieties joined to one another via a linkage group. The most preferred monomers are [2.2](1,4)-naphthalenophane and [2.2](9,10)-anthracenophane. The CVD processes comprise heating the antireflective compound so as to vaporize it, and then pyrolyzing the vaporized compound to form stable diradicals which are subsequently polymerized on a substrate surface in a deposition chamber. The inventive methods are useful for providing highly conformal antireflective coatings on large substrate surfaces having super submicron (0.25 μm or smaller) features.